

STRUCTURAL GENERAL NOTES

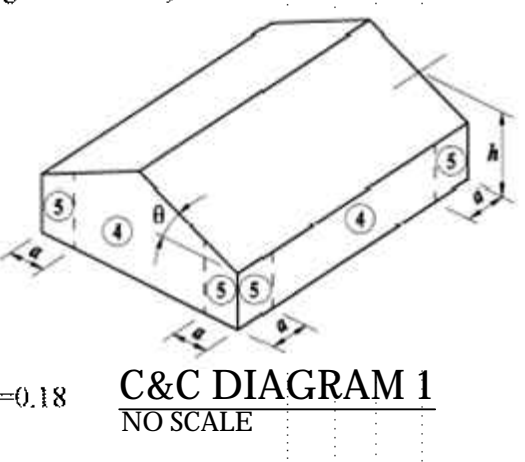
Project: New 8-Story Mixed Use Building
Address: 667 Congress St.
Portland, ME.
SI #: 15-0038

DESIGN LOADS: International Building Code, IBC 2009/MUBEC Edition, except as noted
Occupancy Category, Table 1604.5 II Standard

Residential	40 psf (LL reduced per IBC1607.9)
Corridors Serving Residential Only	40 psf (LL reduced per IBC1607.9)
Stairs, Elevator Lobbies & Public Spaces	100 psf
Wholesale Retail First Floor	125 psf
Garage	40 psf/3,000lb

Roofs & Exposed Garage Areas:	
Ground Snow, (Pg)	60 psf (used for drifting calculations)
Hat Roof Snow, (PT)	42 psf
Snow Exposure Factor (Ce) (Table 1608.3.1)	1.0
Snow importance Factor, (Is) (Table 1604.5)	1.0
Snow Thermal Factor, (Ct) (Table 1608.3.2)	1.0

Lateral:
Wind:
Analysis Procedure IBC 1603.1.4, ASCE 7-05 Analytic Method
3 Second Gust Velocity 100 mph
Importance Factor II, 1.0
Building Category and Internal Pressure Coefficient IBC 1609.2, ASCE Figure 6-5 Enclosed
Exposure C
Components and Cladding Pressures (DP): (See C&C Diagram 1)
35 psf (Area 4) typical unless noted otherwise
60 psf (Area 5) within 10 ft. (Dimension "a") of building corners only.



Seismic:
Importance Factor II, 1.0
Spectral Response Acceleration Short Period S_s 0.315 g
One Second S₁ 0.077 g
Soils Site Class (Table 1613.5.2) B
Design Category (Table 1613.5.2) B
Analysis Procedure Equivalent Lateral Force Method
Seismic Force-Resisting System H (ASCE 7-05, Table 12.2-1)
Response Modification Coefficient (R) 3
Seismic Response Coefficient (Cs) 0.029
Design Base Shear (V) 309 kips

FOUNDATION DESIGN:
Design of footings is based on bearing on solid bedrock typical unless noted otherwise. Footing design may bear on glacial till/structural fill as indicated on plans ONLY. See geotechnical report for preparation of bedrock/subgrade/soils per geotechnical report.
Maximum allowable bearing pressure for footings bearing on bedrock: **10,000 psf**
Maximum allowable bearing pressure for footings bearing on glacial till/structural fill: **4,000 psf**
Bearing on the bedrock/glacial till as approved by the geotechnical engineer at time of construction.
Frost Protection:
2'-0" minimum for footings cast to bedrock.
4'-0" minimum for footings cast to glacial till/structural fill.
Transition zones between footings cast to bedrock and soil shall be per geotechnical report.

-Piles--
Steel piling shall be 6" diameter schd. 80 minimum concrete-filled steel pipe **QR** wide flange HP unless noted otherwise. Piling shall be driven in accordance with the requirements outlined in the geotechnical report. Minimum capacity per pile shall be as noted on the drawings.
• Piles shall be driven to refusal.
• Pile splices as needed shall be groove bevel complete joint penetration welds all around.

-Slabs--
Subgrade Modulus = 150pci
-Retaining Structures--
Coefficient of Friction Native Soil = 0.45. Bedrock = 0.65. Foundation Backfill = 0.55

REINFORCED CONCRETE:
We encourage the use of blast furnace slag in mix designs.
Design is based on "Building Code Requirements for Reinforced Concrete" (ACI 318). Concrete work shall conform to "Standard Specifications for Structural Concrete" (ACI 303).
Structural concrete shall have the following properties:

Intended Use	f _c , psi 28day	Max W/C Ratio	Maximum Aggregate	Slump inches	Entrained Air Percent	Cement Type	Admixtures, Comments
Footings	3,000	.6	3/4" Stone	4	5%	I/II	
Walls & Pilasters	4,000	.45	3/4" Stone	4	5%	I/II	
Int. street slab on deck	3,500	.5	3/4" Stone	4	---	I/II	6x6 - W2.1xW2.1 WWR
Int. topping slab	4,000	.45	3/4" Stone	4	---	I/II	6x6 - W2.1xW2.1 WWR
Ext. slab on metal deck at garage	4,500	.40	3/4" Stone	4	5%	I/II	Salt Corrosion Inhibitor Galv. 4x4 - W2.9xW2.9 WWR
Garage Column Wrap	4,500	.40	3/8" Stone	4	5%	I/II	Salt Corrosion Inhibitor Galv. 6x6 - W2.1xW2.1 WWR
Ext. slab on grade	4,500	.45	3/4" Stone	4	5%	I/II	Galv. 6x6 - W2.1xW2.1 WWR Salt Corrosion Inhibitor
Int. slabs on grade	3,500	.5	3/4" Stone	4	---	I/II	Fibermesh or 6x6 - W2.1xW2.1 WWR
beams, columns	4,000	.45	3/4" Stone	4	5%	I/II	
Pile Caps	4,000	.45	3/4" Stone	4	5%	I/II	
Mass Footing	3,000	.5	3" Stone	6	---	I/II	Per ACI 207.1R Blast Furnace Slag

Detailing, fabrication, and placement of reinforcing steel shall be in accordance with the Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI 315).
Welded wire fabric shall conform to ASTM A185.
Reinforcing bars shall conform to ASTM A615, Grade 60, except ties or bars shown to be field-bent, which shall be Grade 40.
Epoxy coated reinforcing bars shall conform to ASTM 775.
Zinc coated (galvanized) reinforcing bars shall conform to ASTM 767.
Bars to be welded shall conform to ASTM 706.
At splices, lap bars 50 diameters unless noted otherwise.
At corners and intersections, make horizontal bars continuous or provide matching corner bars.
Around openings in walls and slabs, provide 2-#5, extending 2-0' beyond edge of opening.
In continuous members, splice top bars at mid-span and splice bottom bars over supports.
Provide intermittent shear keys at all construction joints and elevations as shown on the drawings.
Except as noted on the drawings, concrete protection for reinforcement in cast-in-place concrete shall be as follows:
a. Cast against and permanently exposed to earth 3"
b. Exposed to earth or weather:
16 through #18 bars 2"
#5 bar, W31 or D31 wire, and smaller 1-1/2"
c. Not exposed to weather or in contact with ground:
Slabs, walls, joists: #11 bar and smaller 3/4"
Beams, columns:
Primary reinforcement 1-1/2"
Stirrups, ties, spirals 1-1/2"

Fibermesh admixture shall be 100% virgin polypropylene, fibrillated fibers as manufactured by Fibermesh Co. or equal per ASTM C-1116 type III 1.4.3 and ASTM C-1116 performance level one, 1.5 lbs per cubic yard of concrete.
Anchor bolts and rods for beam and column-bearing plates shall be placed with setting templates.
Permanent corrugated steel forms for concrete floor slabs shall be manufactured and erected according to the "Specifications and Code of Standard Practice" of the Steel Deck Institute.
All concrete work is subject to inspection by a qualified special inspector employed by the owner in accordance with IBC Section 1704.4.

STRUCTURAL STEEL:

Structural steel shall be detailed, fabricated, and erected in accordance with latest AISC Specifications, and Code of Standard Practice.
Structural steel wide flange beams shall conform to ASTM A992.
Except as noted, framed beam connections shall be bearing-type with 3/4" diameter, snug tight, A325-N bolts, detailed in conformance with Part 4, Tables II and III, for 0.6 times the allowable maximum uniform loads tabulated in Part 2 of the AISC Manual, 9th Edition unless loads are otherwise noted on plan. Install bolts in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts".
All beams shall have full depth web stiffeners each side of webs above and below columns.
Anchor rods shall conform to ASTM F1554, Grade 55, with weldability supplement S1.
Headed anchor studs (HAS) shall be attached to structural steel with equipment approved by the stud manufacturer according to the stud manufacturer's recommendations.
Welding shall be done by a certified welder in accordance with AISC and AWS specifications and recommendations using E70-electrodes. Where not specifically noted, minimum weld shall be 3/16" fillet by length of contact edge.
All post-installed anchors shall have current ICC Evaluation Report, and shall be installed in accordance with the manufacturer's requirements.
Expansion anchors shall be approved "wedge" type unless specifically noted to be "sleeve" type.
Chemical anchors shall be approved epoxy or similar adhesive type and shall have current ICC Evaluation Report. Where base material is not solid, approved screen tubes shall be used.
Groat beneath column base and beam-bearing plates shall be minimum 28-day compressive strength of 7,500 psi, approved pre-bagged, non-metallic, non-gaseous, bleed free, non-drink, when tested in accordance with ASTM C1107 Grade B or C at a flow cone fluid consistency of 20 to 30 seconds.

STRUCTURAL MASONRY:
Design is based on Unit Strength Method MSJC, Section SC-1.4 B.2.
Compressive strength of masonry assembly used for design is 1500 psi, based on net-bedded area.
Hollow load-bearing concrete masonry (CMU) shall be medium-weight units conforming to ASTM C90, Grade N1, minimum compressive strength 1,900 psi based on average net area.
Mortar shall be Type S conforming to ASTM C270.
Masonry cement shall not be used.
Provide full shovels mortar in all head and bed joints.
Admixtures shall not be added for any reason unless approved by the Architect.
Except for lintels, bond beam units shall be protected from standard vertically voided units with pre-cut knockout cross walls.
Groat used in masonry walls and block cells shall be:
3000 psi concrete using 3/8" diameter aggregate, placed by vibrating unless an approved self consolidating mix is used.
Lifts shall not exceed five feet in height.
If groat pour height exceeds 5 feet, clean-out holes shall be provided.
Space continuous horizontal joint reinforcing at 16" maximum in all CMU walls.
Joint reinforcing shall be welded type with 9 gage side-wires and 9 gage truss or ladder cross wires.
Reinforcing bars shall be as for reinforced concrete except as noted.
At splices, lap bars 48 diameters.
Provide reinforced grouted vertical cells at corners, ends of walls, jambs of openings, each side of vertical control joints, and at spacing shown on drawings.
Reinforcement shall be secured against displacement prior to grouting by wire bar locators or other suitable devices at intervals not exceeding 200 bar diameters or 10 feet.
Where noted on the drawings, provide clearance between masonry and structural elements, or wrap steel with polyethylene film.
Provide vertical control joints in all masonry walls as located on architectural drawings or at 25'-0" maximum spacing, at both jambs of openings wider than six feet.
Submit for review Certificates for materials used in masonry construction indicating compliance with the contract documents.
Special Inspection is required by design. See Special Inspection Notes.
MSJC Level 2 Quality Assurance, MSJC Table 1.14.2
Prism and grout tests will be required prior to the start of masonry work shall consist of five (5) masonry prisms.
Test specimens shall be made by the masons, at the direction of the owner's representative, with materials and techniques currently being used in the wall.
Specimens shall be protected and field cured for 48 hours before being transported to a testing agency.
The testing agent will be hired by the owner and shall be responsible for laboratory care and curing of specimens, testing, and reporting results to the owner, contractor, architect, and engineer in accordance with ASTM E447-92

LOOSE LINTELS:
Unless noted otherwise, provide galvanized loose lintels per general notes detail.

LIGHT GAUGE STRUCTURAL STEEL FRAMING:
Member forming shall conform to AISI Cold-Formed Steel Specifications.
All structural framing (joists, studs, track, runners, bracing, and bridging) shall be galvanized sheet steel conforming to ASTM A525, G-60.
Studs and joists 54 mils (16 gauge) and heavier shall be 50 ksi yield.
43 mils (18 gauge) and lighter shall be 33 ksi yield.
Subcontractor shall provide bracing and blocking at a maximum of 6 foot spacing or as required for stability and stiffness of the final assembly wherever sheathing does not provide adequate bracing.
Supplier shall design required lintels and headers at openings where not specifically detailed.
Member sizes noted on drawings are in the new SSM-A standard nomenclature:
(#d)x(s)x(w)(#t)
(#d) Member Depth (inches hundredths)
(s) Style Designation (see Style Designation in table below)
(#w) Flange Width (inches hundredths)
(#t) Material Thickness (mils) (see Mils vs equivalent Gauge in table below)

(s) Style Designation	Member Type	(#w) Mils Thickness	Equivalent Gauge
S	Punched C-Section	18	25
J	Unpunched C-Section	27	22
T	Track	30	20 - Drywall
U	Channel	33	20 - Structural
F	Furring Channel	43	18
		54	16
		68	14
		97	12

SHOP DRAWINGS:

Construction Documents are copyrighted and shall not be copied for use as erection plans or shop details.
Use of SI Inc.'s electronic files as basis for shop drawings requires prior approval by SI Inc. signed release of liability by subcontractor.
payment of an administration fee of \$100 per drawing sheet to SI Inc. and deletion of SI Inc.'s name and Logo from all sheets so used.
The General Contractor and his subcontractors shall submit in writing any requests to modify the plans or specifications.
All shop and erection drawings shall be checked and stamped by the General Contractor prior to submission for Engineer's review.
Unchecked submittals will be returned without review.
Furnish one (1) reproducible and two (2) prints of shop and erection drawings to the Structural Engineer for review prior to fabrication for:
• Concrete reinforcing steel
• Concrete masonry & reinforcing steel
• Structural steel / AESS steel
• Metal stud curtain walls systems
• Bar Joists
• Metal Deck
• Precast & Granite Veneer Submittal and Connections Design
Submit in a timely manner to permit ten (10) working days for review.
Shop drawings submitted for review do not constitute "in writing" unless specifically suggested changes are clearly marked.
In any event, such changes by means of the shop drawing submittal process become the responsibility of the one initiating such change.

FIELD VERIFICATION OF EXISTING CONDITIONS:
Contractor shall thoroughly inspect and survey existing structure to verify conditions that affect the work shown on the drawings.
Contractor shall report any variations or discrepancies to the Architect before proceeding.

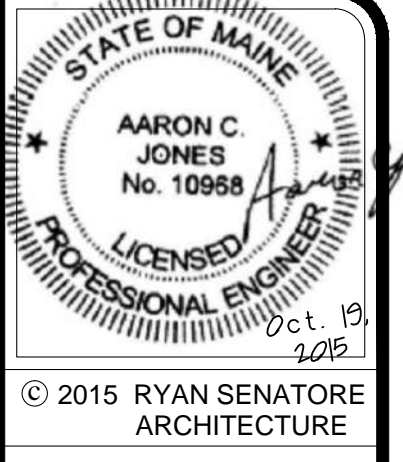
STRUCTURAL ERECTION AND BRACING REQUIREMENTS:
The structural drawings illustrate the completed structure with elements in their final positions, properly supported and braced.
These construction documents contain typical and representative details to assist the contractor.
Details shown apply at all similar conditions unless otherwise indicated.
Although due diligence has been applied to make the drawings as complete as possible, not every detail is illustrated, nor is every exceptional condition addressed.
All proprietary conditions shall be installed in accordance with the manufacturers' recommendations.
All work shall be accomplished in a workmanlike manner and in accordance with the applicable code and local ordinances.
The general contractor is responsible for coordination of all work, including layout and dimension verification, materials coordination, shop drawing review, and the work of subcontractors.
Any discrepancies or omissions discovered in the course of the work shall be immediately reported to the architect for resolution.
Continuation of work without notification of discrepancies relieves the architect and engineer from all consequences.
Unless otherwise specifically indicated, the drawings do not describe methods of construction.
The contractor, in the proper sequence, shall perform or supervise all work necessary to achieve the final completed structure, and to protect the structure, workmen, and others during construction.
Such work shall include, but not be limited to, bracing, shoring for construction equipment, shoring for excavation, formwork, scaffolding, safety devices and programs of all kinds, support and bracing for cranes and other erection equipment.
Do not backfill against basement or retaining walls until supporting slabs and floor framing are in place and securely anchored, unless adequate bracing is provided.
Temporary bracing shall remain in place until all floors, walls, roofs and any other supporting elements are in place.
The architect and engineer bear no responsibility for the above items, and observation visits to the site do not in any way include inspection of them.

ABBREVIATIONS KEY

AB Anchor Rod (Bolt)	EF Each Face	MACH Machine	SC Slip Critical
ADDL Additional	EJ Expansion Joint	MASY Masonry	SCHL Schedule
ADJ Adjustable	ELEV Elevator	MATL Material	SDBT Self Drilling Self Tapping
AFF Above Finished Floor	ELEC Electric (Electrical)	MAX Maximum	SECT Section
ALT Alternate	ENGR Engineer	MB Machine bolt	SF Square Feet
AMT Amount	EQ Equal	MECH Mechanical	SHT Sheet
ANCH Anchor, Anchorage	EQUIP Equipment	MEZZ Mezzanine	SHTG Sheathing
APPROX Approximate	EQUIV Equivalent	MFR Manufacture - er - ed	SIM Similar
ARCH Architect - ural	ES Each Side	MIN Minimum	SLH Short Leg Horizontal
ATR All Thread Rod	EST Estimate	ML Material	SLV Short Leg Vertical
AVG Average	E-W East to West	MO Masonry Opening	SOG Slab on Grade
BC Bottom of Concrete	EXC Excavate	MO Masonry Opening	SP Spaces
BL Brick Ledge	EXP Expansion	MTL Metal	SPEC Specifications
BLK Block	EXT Exterior	NF Near Face	SQ Square
BLKG Blocking	FND Foundation	NIC Not In Contract	ST Sing. Tight
BM Beam	FF Far Face, Finished Floor	NS Near Side	STD Standard
BOT Bottom	F Face to Face	NS North to South	STFF Stiffener
BRG Bearing	FIG Figure	NTS Not to Scale	STL Steel
BW Bottom of Wall	FL Flash	OCJ OSHA Column Joint	STRUCT Structure - al
CB Counterbore	FLG Flange	OD Outside Diameter	SUP Support
CF Cubic Foot	FLR Floor	OF Outside Face	SY Square Yard
CG Center of Gravity	FO Face of	OH Opposite Hand	SYM Symmetrical
CIP Cast in Place	FP Full Penetration	OPNG Opening	T&B Top and Bottom
CI Construction Joint (Control Joint)	FS Far Side	OPP Opposite	T&G Tongue and Groove
CLG Ceiling	FTG Footing	OSB Oriented Strand Board	TB Top of Beam
CLR Clear	GA Gage (Gauge)	PAF Powder Actuated Fastn	TC Top of Concrete
CM Construction Manager (Management)	GALV Galvanized	PC Precast	TD Top of Deck
CMU Concrete Masonry Unit	GC General Contractor	PCF Pounds Per Cubic Foot	THD Thread
COL Column	GEN General	PEN Penetration	THK Thick - ness
COM Common	GL Glee laminated (Gulam)	PERP Perpendicular	TJ Top of Joist
COMB Combination	GR Grade	PL Property Line	TL Total Load
CONC Concrete	GND Ground	PL Parallel Strand Lumber (generic term)	TPG Topping
CONN Connection	GT Girder	PNL Panel	TRANS Transverse
COORD Coordinate - tion	HT Height	PP Panel Point	TW Top of Wall
CS Countersink	ID Inside Diameter	PS Prestressed	TYP Typical
CTR Center	IF Inside Face	PSF Pounds per Square Foot	ULT Ultimate
CY Cubic Yard	INT Interior (Intermediate)	PSI Pounds per Square Inch	UNO Unless Noted Otherwise
DAB Deformed Anchor Bar	JB Joint Bearing	PSL Parallel Strand Lumber	VERT Vertical
DET Detail	JST Joint	PT (1) Post Tensioned	VF Verify in Field
DEV Develop	JT Joint	PT (2) Pressure Treated	WA Wedge Anchor
DIAG Diagonal	K Kip (1,000 lbs.)	PTN Partition	WP Work Point
DIM Dimension	LD Load	PWD Plywood	WT Weight
DL Dead Load	LL Live Load	QTY Quantity	WWF Welded Wire Fabric
DN Down	LLH Long Leg Horizontal	R Radius	XS Extra Strong
DP Drilled Pier	LLV Long Leg Vertical	RE Reference (refer to)	XSECT Cross-section
DT Double Tee	LOC Location	RECT Rectangle	XXS Double Extra Strong
DWG Drawing	LSL Laminated Strand Lumber (generic term)	REIN Reinforce - ed - ing	(E) Existing
DWL Dowel	LT Light	REQ Required	(N) New
EA Each	LVL Laminated Veneer Lumber (generic term)	REQMT Requirement	(R) Remove
ECC Eccentric	RO Rough Opening	RET Retaining	
E-E End to End		RM Room	

Structural Drawing Index

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GENERAL NOTES & ETC.

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